1. SCOPE

This specification provides technical requirements for purchase of a single-phase, 60 HZ, pole-mounted transformer for use on a 13.8kV Delta distribution system.

2. REQUIREMENTS

This specification covers single-phase overhead pole-mounted conventional type transformers. The transformers shall be newly manufactured, constructed in accordance with IEEE C57.12.00, IEEE C57.12.20, IEEE C57.12.31, shall meet The National (DOE) Efficiency Standard requirements, and additional requirements, as outlined in this specification.

2.1 Construction

Single-phase for overhead pole-mounted use on a delta overhead distribution system and furnished with the following features:

a) Two cover mounted high-voltage porcelain bushings, with tinned, copper-alloy, as specified IEEE C57.12.20, Section 7.1.2.1.

b) A tap changer for de-energized operation. Taps shall be 2 – 2 ½ % above and below nominal voltage.

c) Porcelain or polymer low-voltage bushings with terminals to accommodate aluminum or copper conductors. Neutral bushing, if required, shall have provisions for a removable tank ground strap.

d) Internal Fault Detector (IFD). Part #IFD-ORCA-10PSI-A. To be installed per manufacturer's recommendations. Contact IFD Corp. for installation instructions. IFD shall meet IEEE C57.12.20 standards.

e) Secondary bushing terminals shall as specified in IEEE C57.12.20, Section 7.1.2.2 and meet the following requirements:

   1) Studs shall be made of copper.

   2) Connections shall be electrical bronze.

   3) Eye bolt connectors shall have spring coil lock washers.

   4) Threaded connector parts shall be removable without removing bushings.

   5) Clamping bolt threading shall be $^{3}/_{8}$, ½, $^{5}/_{8}$, or ¾ UNC thread Class 2 fit.

6) The connector shall have one or two clamping bolts. U-bolts or J-bolts shall not be used. Connector opening shall be circular and the interior walls shall be smooth.

f) A laser-engraved anodized aluminum diagrammatic transformer nameplate, as outlined in ANSI C57.12.00, Section 5.12, Table 10, "Nameplate A", and shall be permanently mounted in an easily readable location. The nameplate shall also indicate the fluid as containing <2 ppm PCBs.

g) Threaded fitting for a ground fitting.

h) Heavy-duty lifting lugs and hanger brackets.

i) Internal oil level mark to indicate proper level[1].

j) Secondary leads are stamped to indicate proper identification.

k) Corrosion resistant cover band.

l) Bottom shall be recessed to provide protection when being moved over a rough surface.

[1] Note: External oil level gauges shall **not** be installed on pole-mount transformers.

2.2 Ratings

2.2.1 The following standard kVA Ratings are to be used:

5	50
10	75
15	100
25	167
37.5	

2.2.2 Electrical ratings and specifications shall conform to the following:

a) Temperature rise at continuous full load - 65 °C.

b) Hot spot conductor temperature rise - 80 °C.

c) Frequency – 60 Hertz.

d) B.I.L. High voltage – 95 kV.

e) B.I.L. Low Voltage – 30 kV.

2.3 Insulating Fluid

Insulating fluid shall be FM Approvals LLC (FM) Approved, UL[2] Classified less-flammable Cargill Envirotemp FR3[3], ABB BIOTEMP[4], or equivalent, in accordance with FM Approvals Class Number 6933.

[2] UL is a trademark of UL, LLC
[3] Envirotemp, and FR3 are trademarks of Cargill, Inc.
[4] BIOTEMP is a registered trademark of ABB, Inc.

3. VENDOR INFORMATION

Prior to manufacturing, the seller shall provide MSA EU Engineering a review/approval copy of the transformer outline drawing and specifications, including compliance information with The National (DOE) Efficiency Standard, and any exceptions taken to this specification. After MSA EU Engineering has approved the submitted data, the seller shall proceed with the manufacturing of the transformer.

The seller will then forward the vendor information (VI) documentation, to the MSA EU Engineering, as specified in the submittal register, prior to shipment for review and approval.

If documentation is not complete or unacceptable, the supplier shall not ship the equipment until discrepancy is resolved.

After the MSA EU Engineering has approved the data, the seller shall provide the VI information with the shipment.

4. QUALITY ASSURANCE REQUIREMENTS

Routine Testing shall be conducted by seller in accordance with ANSI C57.12.00, Section 8.

5. PREPARATION FOR DELIVERY

5.1. Packing

Packing shall be of such to eliminate possibility of water and other contaminates. Items that could be damaged in load/unload and shipping shall be removed packed in separate packing; or if left attached these items are to be protected.

5.2. Handling

Handling shall be accomplished using lifting eyes provided and transformer shall be kept in upright position and not dropped

6. REFERENCES

The following standards form a part of the Basis of Design to the extent specified within the applicable sections of this document. In each case, the latest edition or version of the standard shall be used. In the event of conflict between documents referenced herein and the requirements of this specification, the requirements of this specification shall take precedence.

10 CFR 431, Subpart K (DOE 2016); Distribution Transformers

FM 6933; Approval Standard for Less Flammable Transformer Fluids

IEEE C57.12.00; General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers

IEEE C57.12.20; Transformers – Standard for Overhead Type Distribution Transformers, 500 kVA and Smaller: High Voltage, 34500 Volts and Below; Low Voltage, 7970/13800Y Volts and Below

IEEE C57.12.31; Pole-Mounted Equipment Enclosure Integrity